Swiss design and development

EoC 2-01

Ethernet over Coax | WiFi

Operation Instructions

KLASSE A CLASS WiFi

Contents

1. Product description 4
1.1. Disposal of wastes 4
1.2. Scope of delivery 4
1.3. Field of application 5
1.4. Connections, indications, operating elements 6
1.5. Application examples 7
1.5.1. Feeding in of IP data in a SAT-IF distribution structure: 7
1.5.2. Feeding in of IP data in a CATV distribution structure: 8
1.5.3. Feed in of IP data in a headend system: 8
2. Installation and commissioning 9
3. Basic functions 10
3.1. Standby mode: 10
3.2. EoC Reset button: 10
3.3. EoC Reset Function: 10
3.4. WiFi WPS/Reset button: 10
3.5. WiFi access: 10
4. EoC network with encryption 11
4.1. Pair or group formation: 11
5. Settings for the WiFi network 12
5.1. Accessing the configuration screen 12
5.1.1. Login 12
5.2. Operation Mode 13
5.3. Wireless Settings 14
5.3.1. Wireless Basic Settings 14
5.3.2. Wireless Security Setup 14
5.3.3. Wireless Site Survey 15
5.3.4. Wireless Advanced Settings 15
5.4. Wireless Schedule 16
5.5. TCP/IP Settings 16
5.5.1. LAN Interface Setup 16
5.6. Management 17
5.6.1. Access Point Status 17
5.6.2. Statistics 17
5.6.3. Time Zone Setting 18
5.6.4. System Log 18
5.6.5. Upgrade Firmware 19
5.6.6. Save / Reload Settings 19
5.6.7. Password Setup 20
6. Troubleshooting 21
6.1. LEDs 21
7. Technical data 22
7.1. Data sheet 22
7.2. Drilling template 23

Safety instructions

- ➔ Do NOT use the device near water or in rooms with high humidity such as humid cellars or near swimming pools.
- ➔ Do NOT use the device outdoors. All connections must be located inside a building.
- ➔ Keep the device away from moisture, dust or corrosive liquids.
- ➔ Do NOT install the device, use it or perform maintenance during a thunderstorm. There is a risk of electric shock during thunderstorm.
- ➔ Connect ONLY appropriate accessories to the device.
- ➔ Make sure that all cables are connected to the correct port.
- ➔ Carefully lay the Ethernet, antenna and electric cables to ensure that nobody can step on or stumble over them.
- ➔ Do NOT cover the ventilation slots of the device since insufficient air supply may result in damage to the device.
- ➔ Do NOT place any objects on the device. Position the device in a place where NOBODY can step on it.
- ➔ Prior to maintenance or dismounting work, disconnect the Ethernet and electric cable from the device.
- ➔ In case of damage, interrupt the power supply.
- ➔ Do NOT try to repair the device. Contact your local retailer to order a new device.
- ➔ Do NOT open the device or unit. Opening the device or removing its covers causes risks, for example due to high voltage. This device should ONLY be repaired or uninstalled by qualified service personnel. For more information, contact your retailer.

1. Product description

1.1. Disposal of wastes

Your device is marked with the WEEE symbol (Waste Electronics and Electrical Equipment). This means that the electrical and electronic components must not be disposed of as residual waste. Used electrical and electronic components must be disposed of separately.

1.2. Scope of delivery

EoC 2-01

1 x EoC 2-01 Ethernet over Coax Modem

1 x Network cable 1.5 m (RJ45)

1 x Power cable with euro plug

1 x CFA 8-00 terminating resistor

1 x Quick Start Guide

EoC 2-00

2 x EoC 2-01 Ethernet over Coax Modem

2 x Network cable 1.5 m (RJ45)

2 x Power cable with euro plug

2 x CFA 8-00 terminating resistor

2 x Quick Start Guide

Lieferbares Zubehör:

- IEC connecting cable 1.5…10 m BAK 150-80 – 999-80
- Modem connecting cable 1.5…10 m MAK 150-80 – 999-80
- Adapter F/IEC CFA 1-00, IEC socket / F plug
- Adapter F/IEC CFA 10-00, IEC plug / F plug
- Combiner TZU 40-03

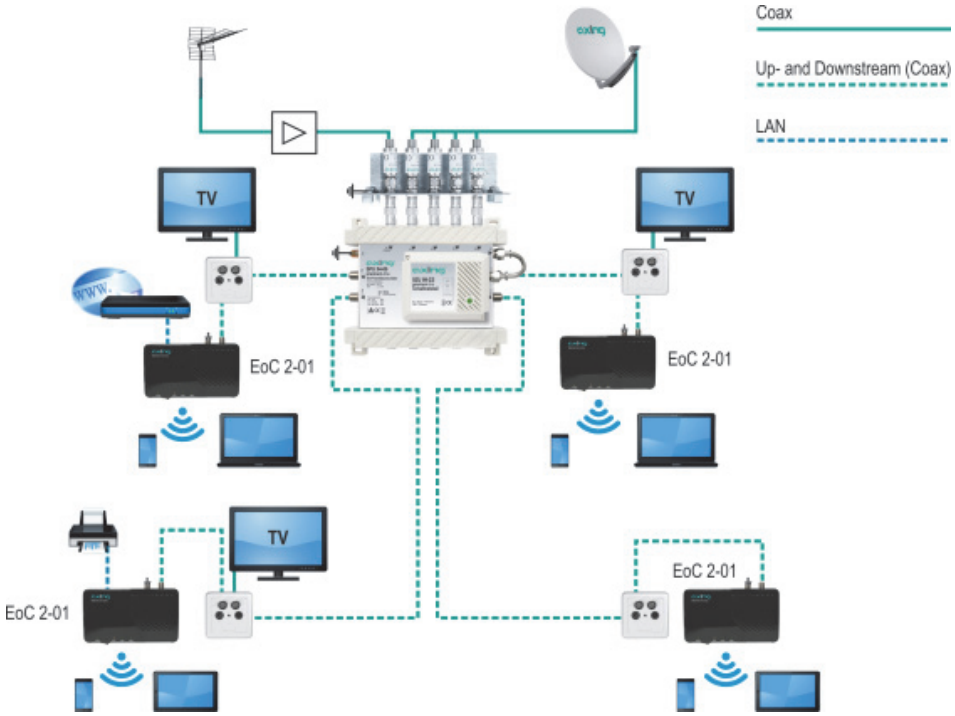
1.3. Field of application

The EoC 2-01 modem allows feeding in of IP data signals from the Internet, for example via a router in an existing coaxial antenna distributor, such as SAT-IF-, DVB-T, CATV- or head end distribution systems (in the star or tree distribution).

Several Eoc 2-01 modems communicates in a Peer-to-Peer mode. This means that each modem can communicate with each modem in the network.

The advantage of an ethernet solution over a coax solution is that no new network cables must be laid. The data is transmitted through the low-attenuation return channel, frequency range of 2...68 MHz. Depending on the quality of the coaxial cable, transmission distances of up to 700 m can be realized.

The feeding in is performed via the return channel capable terrestrial input of the SAT multiswitch, via the terrestrial input of the antenna distributor structure or via a return channel capable antenna socket in the distribution network (see example 1...5).



Internet or other fed IP data are available at return channel capable antenna sockets (e.g. AXING antenna socket BSD 4-xx, BSD 21-xx, BSD 960-00, BSD 961-xx, BSD 963-xx, SSD 2-xx, SSD 4-00, SSD 5-xx, SSD 6-xx or SSD 7-00) (connection examples for AXING antenna sockets are given on the Internet under www.axing.com | Download).

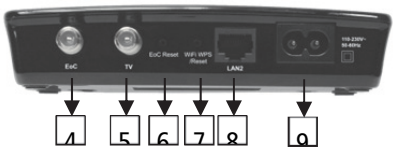
Two networkable devices can be connected to the LAN ports of a EoC modem. The IP network can be extended to up to 64 EoC devices.

All devices connected to the EoC modems can communicate between each other. Data is exchanged, network games are transmitted or a centralized network printer can be accessed. For the monitoring of houses, rooms etc., an IP camera can be operated via a EoC modem.

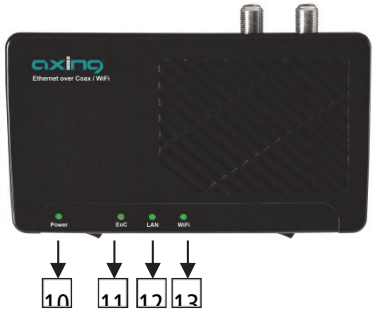
The EoC 2-01 WiFi modem has an integrated router with WLAN function which allows you to establish an internet connection on smart phones, tablet PCs and any other WLAN end devices without any problems, quickly and easily.

The EoC 2-01 WiFi modem as WLAN access point establishes communication between your WLAN devices and an existing LAN network. In this way for example you can instantly extend your network to include even rooms which would not be accessible otherwise.

1.4. Connections, indications, operating elements



1. Power ON/OFF
2. LAN, RJ 45 socket
3. WiFi ON/OFF
4. EoC F socket 2-862 MHz (data 2-65 MHz)
5. TV F socket 85-862 MHz
6. EoC Reset button
7. WiFi WPS/Reset button
8. LAN, RJ 45 socket
9. Mains socket 110-230 V
10. Power LED
11. EoC LED
12. LAN LED
13. WiFi LED



A TV or radio device can be connected to the TV-F socket on the rear side of the EoC modem. The integrated distributor is equipped with a highly selective filter so that the TV/radio reception is not interfered with by the data traffic.

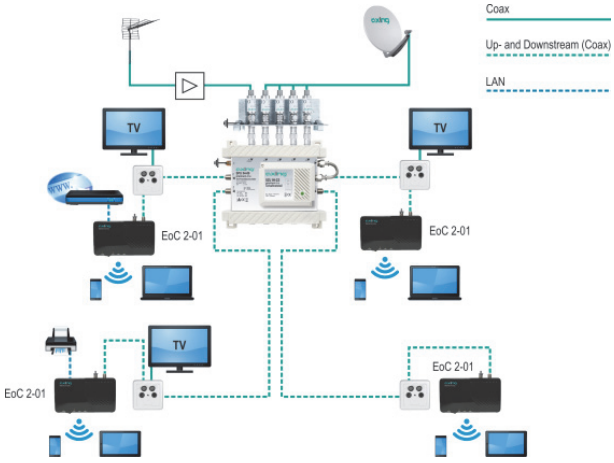
If the TV F socket ist not used, the socket has to be terminated with an termination resistor CFA 8-00!

1.5. Application examples

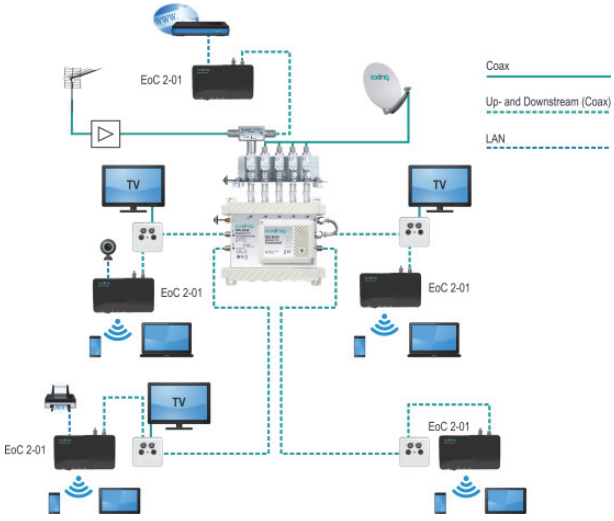
All components in the distribution structure must support the return channel frequency range 2-68 MHz. This also applies to SAT multiswitches, the passive distribution components and for antenna sockets.

1.5.1. Feeding in of IP data in a SAT-IF distribution structure:

If the terrestrial input of the SAT multiswitch is not assigned, it must be terminated with a 75 Ohm terminating resistor.

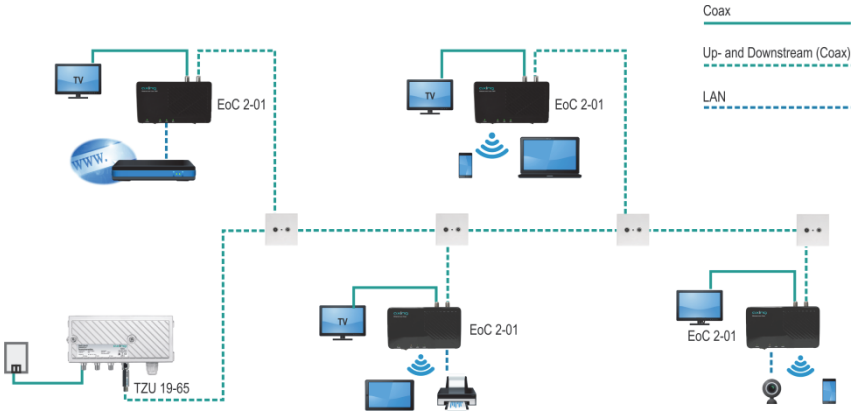


Example 1: The feeding of the IP signal is performed via the **return channel capable antenna socket**.

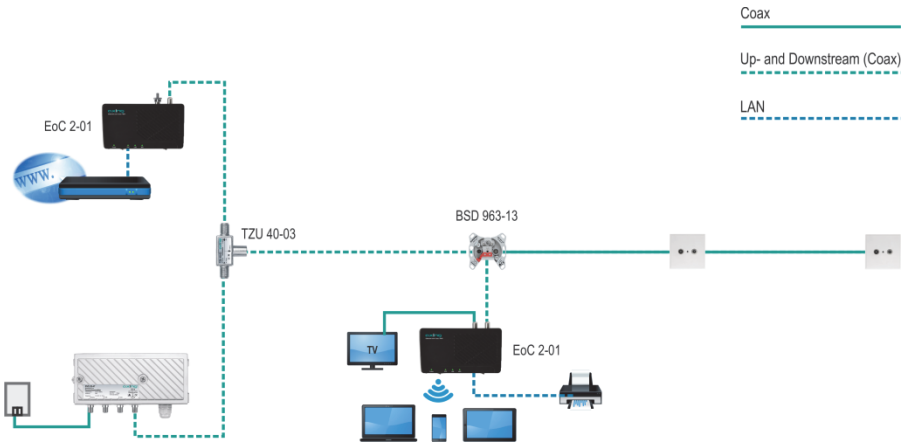


Example 2: The feeding of the IP signal is performed via the **return channel capable terrestrial input of the multiswitch**. A combiner TZU 40-03 is used. It prevents that the IP signals are transferred via the return channel into the receive antenna system.

1.5.2. Feeding in of IP data in a CATV distribution structure:

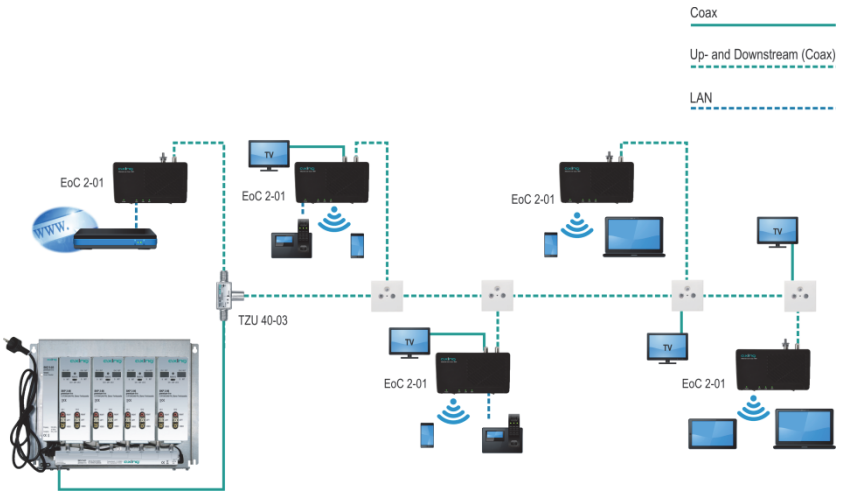


Example 3: The feeding of the IP signal is performed via **the return channel capable antenna socket.** If the IP-data are fed via the antenna socket, a high-pass filter TZU 19-65 must be installed in the coaxial supply line (amplifier output).



Example 4: IP data feeding for exactly one antenna socket: The feeding of the IP signal is performed **via the EoC combiner TZU 40-03**. The integrated high pass of 85-1006 MHz prevents the transmission of the IP signal in the CATV network. The antenna socket BSD 963-13 is equipped with a high pass filter on the trunk. The IP signal will not be transferred to the following antenna sockets.

1.5.3. Feed in of IP data in a headend system:



Example 5: The feeding of the IP signal is performed **via the EoC combiner TZU 40-03**. The combiner TZU 40-03 has an integrated high pass of 85-1006 MHz. The high pass prevents the transmission of the IP signals to the head end.

2. Installation and commissioning

1. Connect the router with the enclosed Ethernet cable to one of both RJ-45 LAN sockets of the EoC modem.
1. Connect the EoC socket to the available antenna network structure
   (see example 1 to 4).

There are several ways to feed the IP data into the existing antenna network structure.

- via a return channel capable antenna socket in the distribution network (see example 1 or 3)
- via the passive terrestrial input of the SAT multiswitch or the passive terrestrial input of a distribution structure (see example 2 or 4).

2. Connect your computer using the enclosed Ethernet cable to one of both RJ-45 LAN sockets of the second EoC modem.
3. Then connect the EoC modem using the EoC-F socket to the return channel capable antenna socket (see example 1 or 3) or to the **return channel capable** EoC combiner (see example 2 or 4).

➔ Repeat step 3 + 4 for further commissioning of EoC 2-01.

After all connections have been established, the EoC devices can be switched on by means of the mains switch and the connected devices (PC, laptop etc.) can be booted up.

The LEDs Power, EoC, LAN and WiFi are lit and the data transfer is established.

Notes:

- Up to two networkable devices can be connected to one EoC modem without any switch.
- Additionally, a TV or radio device can be connected to the TV-F socket of the EoC modem.

3. Basic functions

After having switched on the EoC modem, the LEDs should indicate the following states:

- The green Power LED is lit.
  - After approx. 10 seconds, the LEDs are lit/flashing as follows:
  - EoC LED green (flashes in case of data traffic)
  - LAN LED green (flashes in case of data traffic)
  - WiFi LED green (if WiFi is switched on) green (flashing in case of data traffic)

3.1. Standby mode:

The EoC modem switches after several minutes without data traffic to the Standby mode. The Power LED is flashing green then.

3.2. EoC Reset button:

The EoC reset button is used for the following functions:

- reset to the factory default setting (press > 10 s).
- delete the network key (press 5…8 s)
- generate a private network (press <1 s)

3.3. EoC Reset Function:

Hold the reset button depressed for one second using a bent up paper clip, in order to reset the device to the factory defaults.

The EoC reset button does not work in standby mode.

3.4. WiFi WPS/Reset button:

The WiFi WPS/Reset button is used to reset the WiFi router to the factory IP address 192.168.100.111

- The WiFi WPS/reset button does not work in standby mode.

3.5. WiFi access:

➔ Switch WiFi ON. WiFi is active:

- Network name (SSID) = EoCxxxxxx
- (xxxxxx = last six signs of the MAC adress, you find on the type label of the modem)
- Encryption = WPA2
- Password = 0000000000000000

You should change the default password to secure your WiFi network!

4. EoC network with encryption

An EoC network consists of two or several (maximum 64) EoC modems which use the same network key.

In an existing antenna system with several participants, all devices can communicate with each other. Therefore, you should create a private EoC network.

Securing your EoC network allows you to protect the information sent via the network from unauthorized access. This is particularly important in multi-family homes, office buildings, schools and other buildings.

There are two ways to secure your EoC network.

- Use the EoC Reset button to generate a random network key automatically.
- You can use the Security software to specify a key for your EoC network (free download under http://www.axing.com | Download).

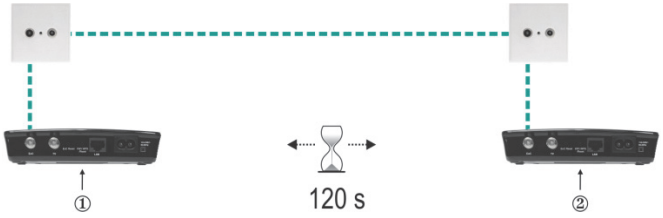
4.1. Pair or group formation:

Deleting the network key:

To generate an invidual network key, you have to delete the default network key first. Press the EoC Reset button on the rear side of the EoC device for 5…8 seconds (until the Power LED flashes). Carry out this step for all devices.

Pair and group formation:

Press the EoC Reset button briefly (<1 s) on the rear side of the EoC device. The Power LED starts flashing. Now also press the EoC Reset button of the next EoC modem briefly. A new network key between the two EoC modems is generated and the devices establish a connection. The EoC LED will flash for a short time.



In order to connect the two devices to each other, press the EoC Reset button on the second device within a time period of two minutes.

➔ Check the LEDs on both EoC devices. The Power LEDs must flash during the connection establishment of the devices. Wait for approx. one minute while the EoC devices get connected to each other. As soon as the procedure has been completed, both Power- and EoC LEDs are again permanently lit.
If the Power LED is not flashing, after you have pressed the EoC Reset button, then you might have kept it pressed for too long.

➔ Try it again and press the WiFi WPS/Reset button for <1 second.
If the EoC LEDs are not lit on both EoC devices, the EoC devices are not connected. Repeat the steps in this section.

5. Settings for the WiFi network

The EoC 2-01 WiFi modem is configured using a web browser. The factory IP address is 192.168.100.111 and the subnet mask is 255.255.255.0.

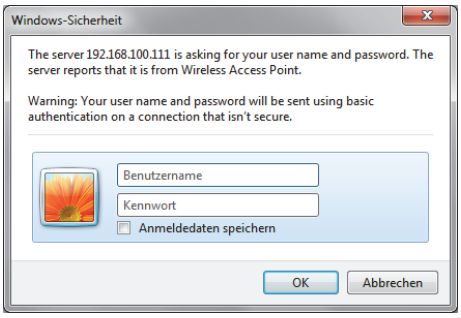
The WiFi WPS/Reset button is used to reset the WiFi router to the factory IP address 192.168.100.111. Press the WiFi WPS/Reset button and keep it pressed for at least 10 seconds. Then switch off the device and switch it on again. The device is now in the delivery state again.

5.1. Accessing the configuration screen

➔ Change the IP address of the PC / laptop, for example to 192.168.100.11:
Control panel > Network connections > LAN connection >Properties >
Internet protocol version 4 TCP/IPv4 > Properties > Use the following IP address:
Press OK to save.

➔ Connect the EoC 2-01 using a LAN patch cable to the PC / laptop.

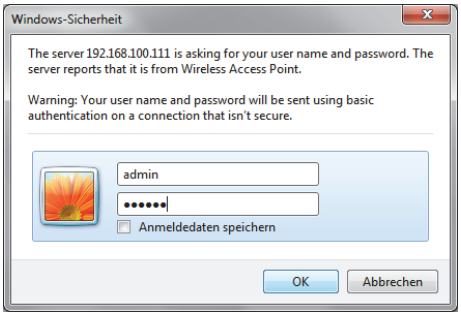
➔ Now enter the IP address 192.168.100.111 in the web browser.
A dialog for user name and password input is displayed.


Windows-Sicherheit
The server 192.168.100.111 is asking for your user name and password. The server reports that it is from Wireless Access Point.
Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.
Benutzername
Kennwort
Anmeldedaten speichern
OK
Abbrechen

5.1.1. Login

The configuration screen of the EoC 2-01 is protected by a password.

➔ Enter the user name admin and then the ex-factory preset password 000000

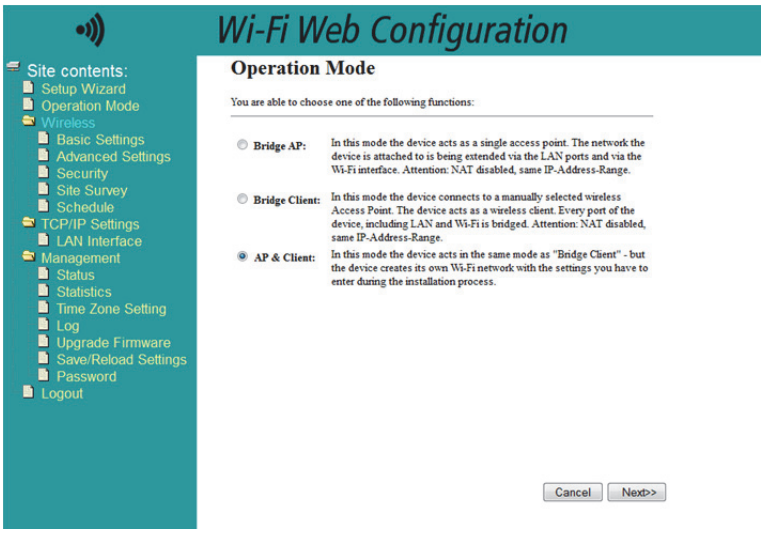

Windows-Sicherheit
The server 192.168.100.111 is asking for your user name and password. The server reports that it is from Wireless Access Point.
Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.
admin
Anmeldedaten speichern
OK
Abbrechen

➔ Click Ok.
The Wireless AP router window is opened.

5.2. Operation Mode

The main page, called "Setup Wizard" offers you the most basic settings needed for Wi-Fi operating mode.

After selecting one of the following options, you will be guided through the installation process.


Wi-Fi Web Configuration
Site contents:
Setup Wizard
Operation Mode
Wireless
Basic Settings
Advanced Settings
Security
Site Survey
Schedule
TCP/IP Settings
LAN Interface
Management
Status
Statistics
Time Zone Setting
Log
Upgrade Firmware
Save/Reload Settings
Password
Logout
Operation Mode
You are able to choose one of the following functions:
Bridge AP:
In this mode the device acts as a single access point. The network the device is attached to is being extended via the LAN ports and via the Wi-Fi interface. Attention: NAT disabled, same IP-Address-Range.
Bridge Client:
In this mode the device connects to a manually selected wireless Access Point. The device acts as a wireless client. Every port of the device, including LAN and Wi-Fi is bridged. Attention: NAT disabled, same IP-Address-Range.
AP & Client:
In this mode the device acts in the same mode as "Bridge Client" - but the device creates its own Wi-Fi network with the settings you have to enter during the installation process.
Cancel
Next>>

You are able to choose one of the following functions:

Bridge AP

In this mode the device acts as a single access point. The network the device is attached to is being extended via the LAN ports (device acts as switch) and via the Wi-Fi interface.

If EoC feature is used, the EoC network is also being bridged. This means, every device connected to the EoC 2-01 network is automatically part of the network the EoC-device is part of.

Attention: NAT disabled, same IP-Address-Range, if there is a DHCP-Server in the existing network, this Server also assigns IP-Addresses in the network of the EoC 2-01. There is no need to configure a network-internal DHCP-Server separately.

Bridge Client

In this mode the device connects to a manually selected wireless Access Point. The device acts as a wireless client.

Every port of the EoC 2-01, including LAN and Wi-Fi is bridged. This means, every device connected to the EoC 2-01 network is automatically part of the wireless network the device is connected to.

Attention: NAT disabled, same IP-Address-Range, if there is a DHCP-Server in the existing network, this Server also assigns IP-Addresses in the network of the EoC 2-01. There is no need to configure a network-internal DHCP-Server separately.

Attention: The EoC 2-01 is not able to connect to existing networks, which use WPA in this mode.

AP & Client

In this mode the device acts in the same mode as "Bridge Client" - but the EoC 2-01 device creates its own Wi-Fi network with the settings you have to enter during the installation process.

During the installation process you will have to select to which Wi-Fi network the device should connect to. The web-front-end offers you a "Wireless Site Survey" at that specific installation point.

Attention: Please note that the newly created network uses the same channel as the network to which the device connects to.

5.3. Wireless Settings

5.3.1. Wireless Basic Settings

On this page the settings for the local Wi-Fi Access Point are set.

Attention: Only 2.4 GHz-Mode is supported!

In the "Mode" menu you can select whether you want the device to act as "AP" (Access Point), "Client" (of another Wi-Fi-Network) or "AP + WDS".

5.3.2. Wireless Security Setup

On this page the settings for Wireless Security are set.

Please note that only WPA & WPA2 are secure options (WEP is known to be vulnerable).

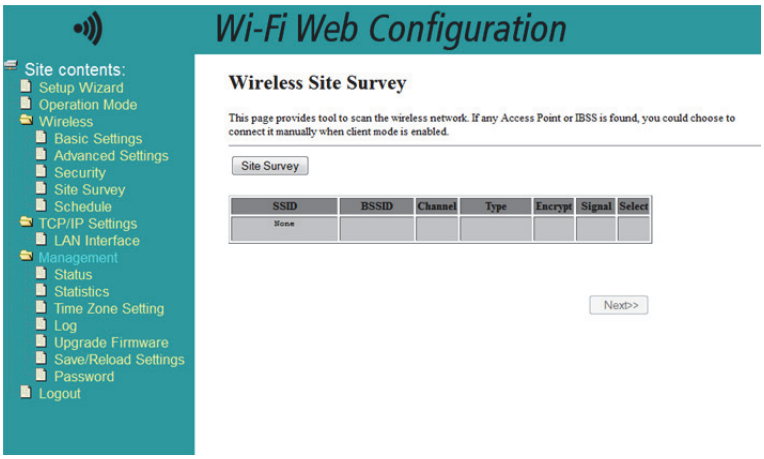
The use of WPA2-AES (no mixed mode) is recommended.

The key has to consist of at least 8 characters.

You are free to choose of capital and small letters as well as digits.

5.3.3. Wireless Site Survey

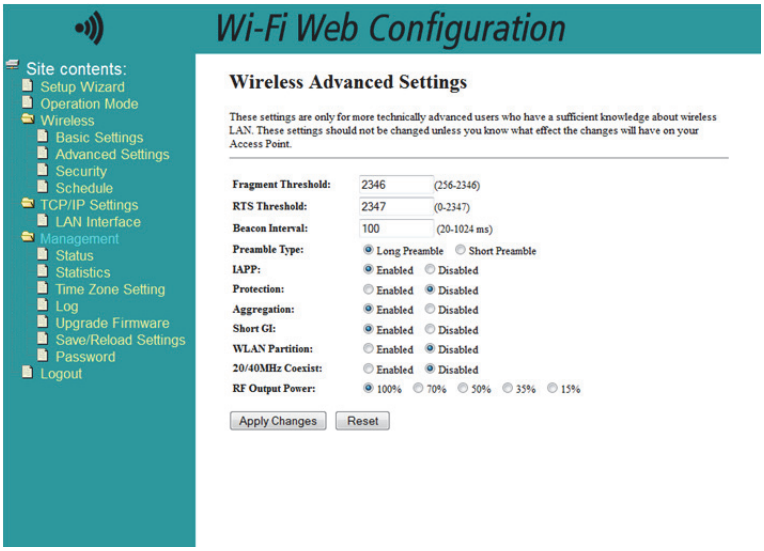
Before applying the settings you have to decide to which Wi-Fi network you want the EoC 2-01 to connect to.



You can rescan the available networks using the "Site Survey" button on top.

5.3.4. Wireless Advanced Settings

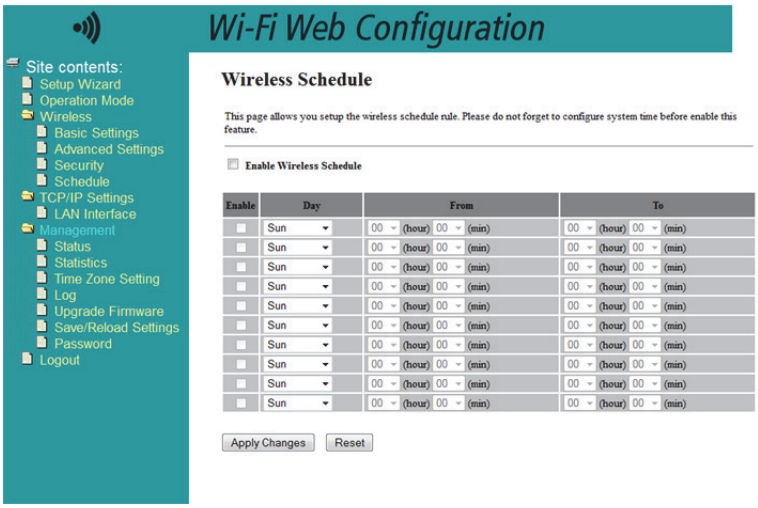
Very specific advanced Wi-Fi settings can be set here.



For example you can adjust the RF Output Power, which directly correlates with the Wi-Fi coverage range.

5.3.5. Wireless Schedule

The Wireless Schedule allows the user to set times at which the Wi-Fi broadcast is being deactivated.

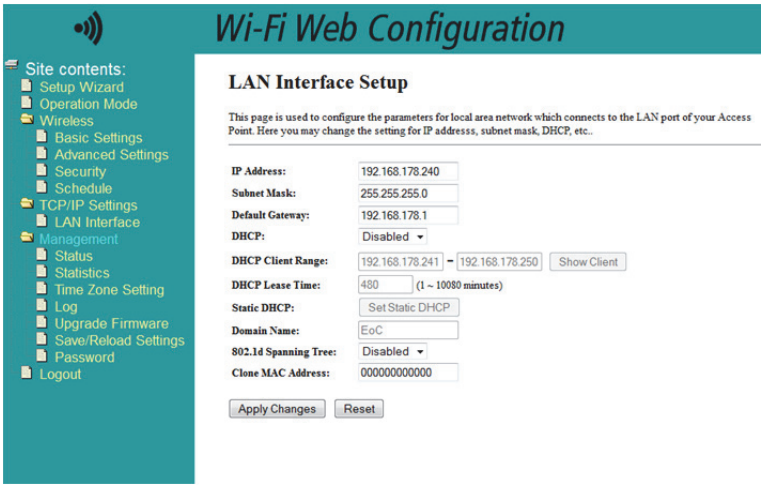


You can for instance choose to disable Wi-Fi at night.

This feature is disabled by default.

5.4. TCP/IP Settings

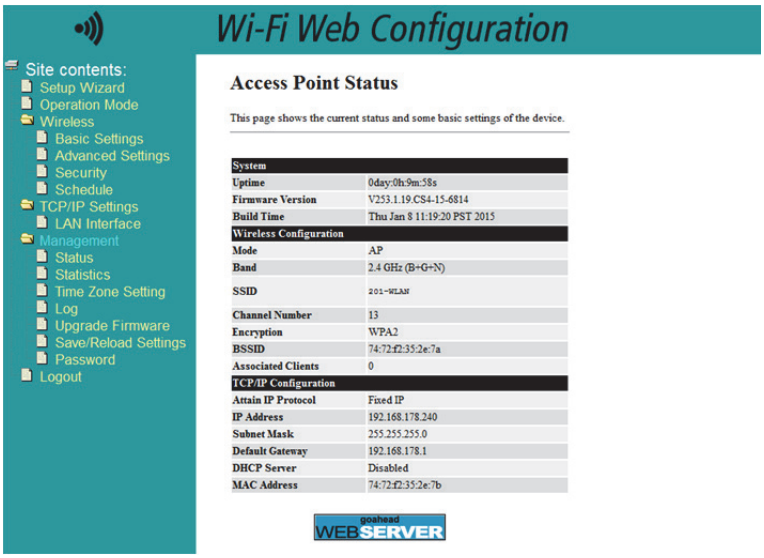
5.4.1. LAN Interface Setup



On this page the IP Address and Subnet Mask of the local EoC 2-01 device is being set.

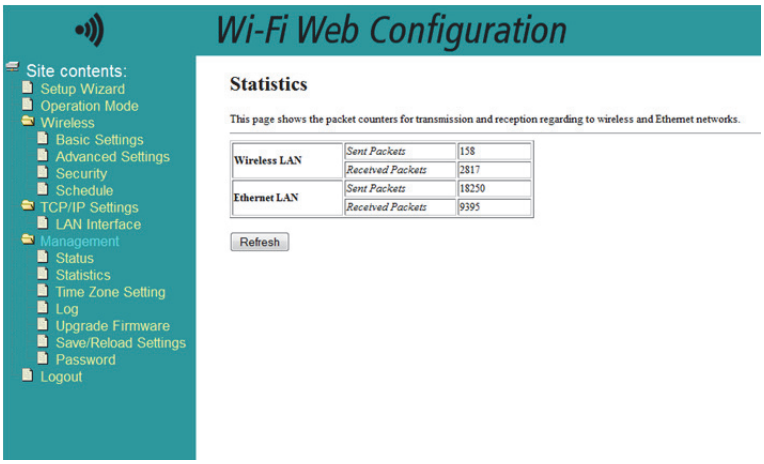
5.5. Management

5.5.1. Access Point Status



The status page shows some basically information about the system, Wi-Fi Connection and LAN Connection.

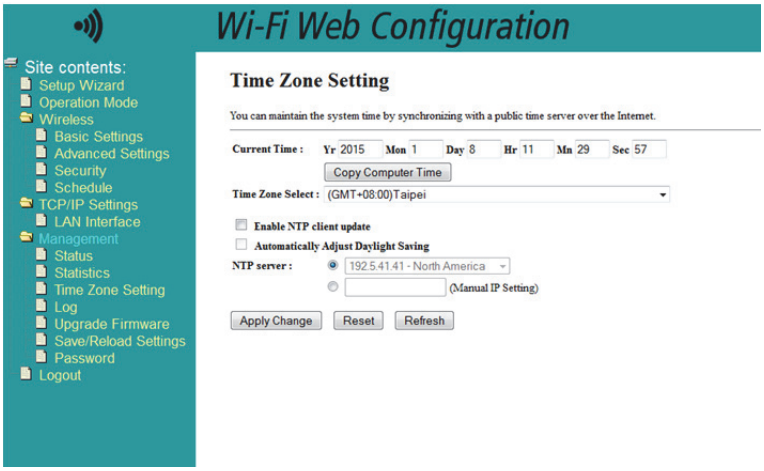
5.5.2. Statistics



This page gives you an overview about sent / received packets inside the specific networks.

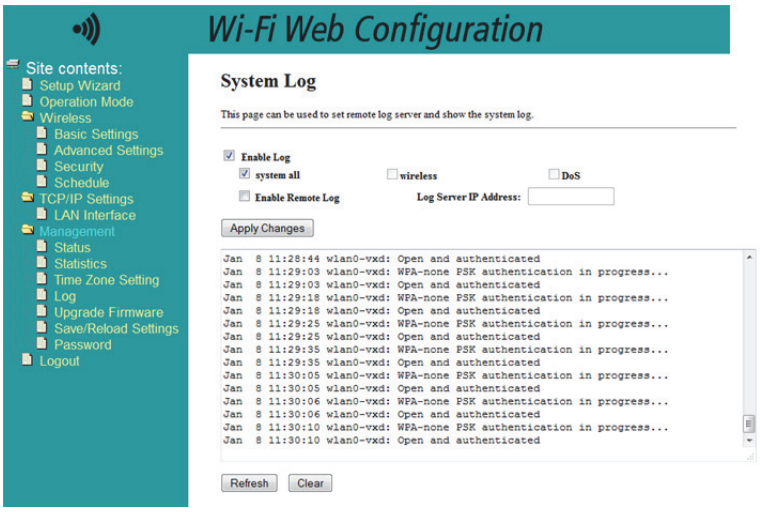
5.5.3. Time Zone Setting

Time, Date and Time-zone can be adjusted here. Optionally a NTP (Network Time Protocol) Server can be added here, too.



5.5.4. System Log

On this page you can view the current system log. Also you can specify a log server to upload the logs to.


Wi-Fi Web Configuration
Site contents:
Setup Wizard
Operation Mode
Wireless
Basic Settings
Advanced Settings
Security
Schedule
TCP/IP Settings
LAN Interface
Management
Status
Statistics
Time Zone Setting
Log
Upgrade Firmware
Save/Reload Settings
Password
Logout
System Log
This page can be used to set remote log server and show the system log.
Enable Log
system all
wireless
DoS
Enable Remote Log
Log Server IP Address:
Apply Changes
Jan 8 11:28:44 wlan0-vxd: Open and authenticated
Jan 8 11:29:03 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:29:03 wlan0-vxd: Open and authenticated
Jan 8 11:29:18 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:29:18 wlan0-vxd: Open and authenticated
Jan 8 11:29:25 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:29:25 wlan0-vxd: Open and authenticated
Jan 8 11:29:35 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:29:35 wlan0-vxd: Open and authenticated
Jan 8 11:30:05 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:30:05 wlan0-vxd: Open and authenticated
Jan 8 11:30:06 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:30:06 wlan0-vxd: Open and authenticated
Jan 8 11:30:10 wlan0-vxd: WPA-none PSK authentication in progress...
Jan 8 11:30:10 wlan0-vxd: Open and authenticated
Refresh
Clear

5.5.5. Upgrade Firmware

This page enables you to upload new released firmware versions.

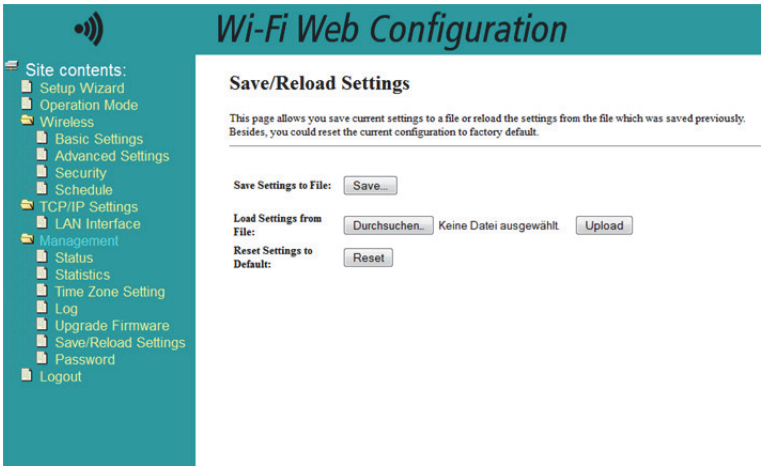
In case of an update you receive a document with additional information about how to update the device.

In some cases it is necessary to clear your browser-cache after you upgraded your firmware.

Updates are published on our website: http://www.axing.com/.

5.5.6. Save / Reload Settings

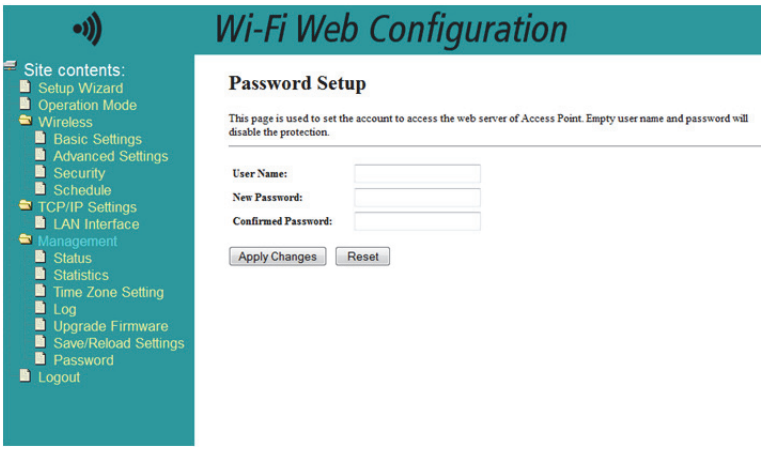
At this page you can export the current configuration into a file to download onto your local computer.



Also it is possible to restore these settings or load factory defaults.

5.5.7. Password Setup

This page allows you to customize the used password for accessing the web-front-end.



The default credentials are:

User: 'admin'

Password: '000000'

6. Troubleshooting

6.1. LEDs

The LEDs indicate an "activity" and are used for troubleshooting.

Power LED off

➔ Make sure that the network cable is connected correctly.
➔ Make sure that the mains switch of the EoC modem is switched on.

LAN LED is not flashing

No data traffic. Check the following:
➔ Are the router and the modem switched on?
➔ Is the Ethernet cable connected firmly to the LAN port of the router/modem?
➔ Can the PC - connected to the router - establish a connection to the Internet?
➔ Press the EoC Reset button on each EoC modem for 10 seconds to restore the factory settings of the EoC modem.
➔ If necessary generate a new network key (see chapter 4 on page 12).

EoC LED off - is not lit

The EoC devices cannot be found.
➔ Make sure that the EoC devices are connected to the same antenna network and that they use the same network key.
➔ Position the EoC modem closer to the computer or the EoC modem.
➔ After having activated the network security, make sure that all EoC modems use the same network key.
➔ If the problem occurs, after the network key has been changed, re-establish the factory settings of each device again. Then, you can generate the key again (see chapter 4 on page 12).
➔ Check whether your antenna system provides a return channel.

EoC-LED is lit in red

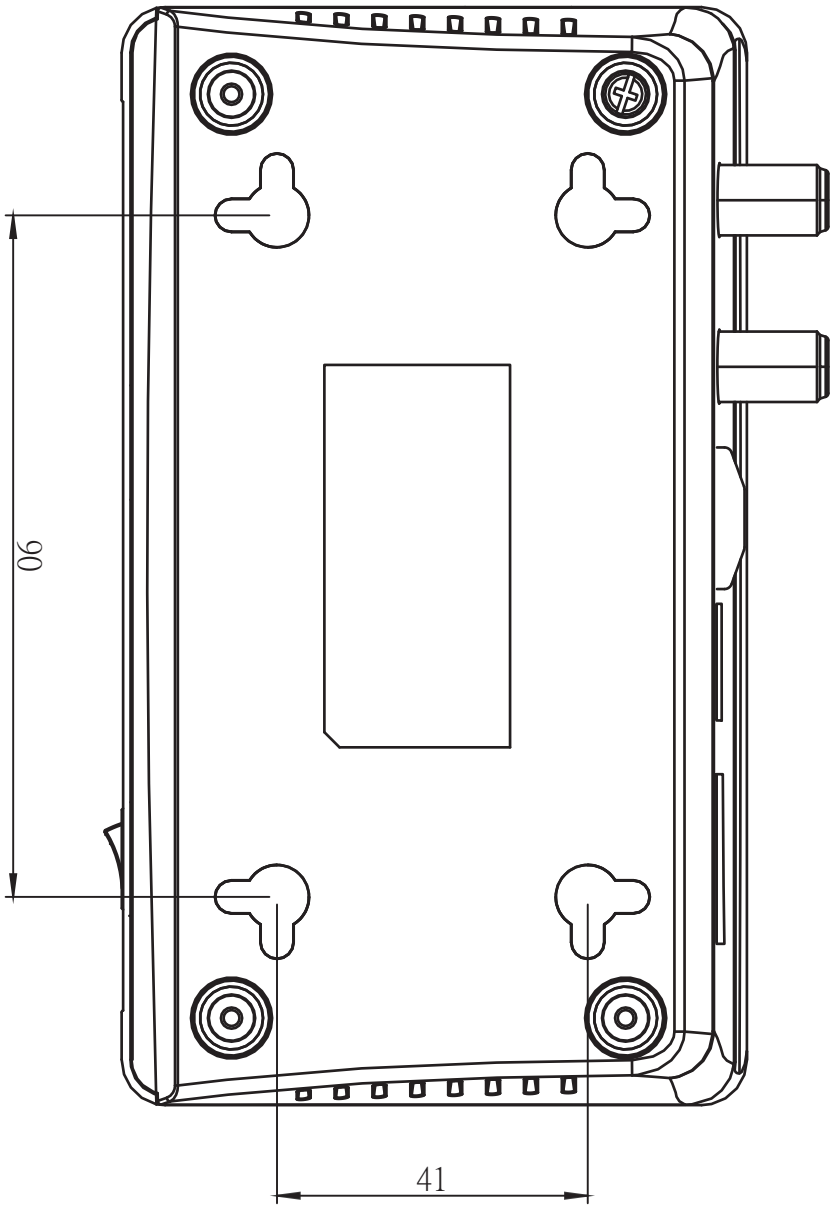
➔ The line attenuation between the EoC modem is too high. Position the EoC modem closer to the master device.

7. Technical data

7.1. Data sheet

Frequency range	
EoC input/output	2…1006 MHz
IP signal	2…68 MHz
TV output	85…1006 MHz
Through loss	<0,5 dB
Output level min. 1…30 MHz	100 dBµV
Output level min. 30…68 MHz	90 dBµV
Network	Up to 64 EoC modems
Gross data rate	500 Mbps
Net data rate	230 Mbps
Range	up to 700 m
Modulation	4096/1024/256/64/16/8-QAM, QPSK, BPSK and ROBO modulation scheme
Encryption	128 bit AES
Ethernet interface	10/100/1000 Mbps
Network standards	Home Plug AV IEEE1901, IEEE802.3, IEEE802.3u
WiFi network standard	IEEE 802.11/b/g/n
Frequency range	13 channels 2.412GHz~2.472GHz
Connections (TV/EoC)	2 F sockets
Connections (LAN)	2 RJ 45
LEDs	Power /EoC /LAN/WiFi
Switching power supply unit	110-230 V~ 50/60 Hz
Power consumption	max. 5.5 W
Operating temperature	0°C ~ 40°C
Dimensions	145 (W) x 82.5 (D) x 33 (H) mm
Corresponds to the standards	EN 50083-2 Class A

7.2. Drilling template



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